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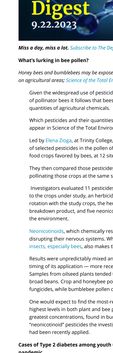
Will Doctors Prescribe Your Food? + Teens, Type 2 Diabetes and the Pandemic + More

The Defender's Weekly Science Digest delivers a roundup of the latest scientific studies related to children's health, including studies on vaccines, drugs, chemicals, pesticides and food exposure.

By **Angela DePalma, Ph.D.**



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What's lurking in bee pollen?

Honey bees and bumblebees may be exposed to pesticides differently when foraging on agricultural areas; Science of the Total Environment, Oct. 20, 2023.

Given the widespread use of pesticides on food crops and the importance of pollinator bees it follows that bees and bee products could harbor trace quantities of agricultural chemicals.

Which pesticides and their quantities were the subjects of a study that will appear in Science of the Total Environment next month.

Led by Elena Zioga, at Trinity College, Dublin, researchers measured levels of selected pesticides in the pollen of oilseed rape and broad beans, two food crops favored by bees, at 12 sites in Ireland.

They then compared those pesticides and levels to pollen from bees pollinating those crops at the same sites.

Investigators evaluated 11 pesticides: three fungicides commonly applied to the crops under study, an herbicide applied to crops planted in rotation with the study crops, the herbicide glyphosate and its main breakdown product, and five neonicotinoid pesticides known to persist in the environment.

Neonicotinoids, which chemically resemble nicotine, kill insects by disrupting their nervous systems. What makes neonicotinoids deadly for insects, especially bees, also makes them dangerous for humans.

Results were unpredictably mixed and depended on the pesticide and the timing of its application — more recent did not mean higher levels. Samples from oilseed plants tended to be more contaminated than from broad beans. Crop and honeybee pollen tended to show the most toxic samples, while bumblebee pollen contained more insecticides.

One would expect to find the most recently applied pesticides at the highest levels in both plant and bee pollens but that was not the case. The greatest concentrations, found in bumblebee pollen, were of all five "neonicotinoid" pesticides the investigators were looking for, none of which had been recently applied.

Cases of Type 2 diabetes among youth under 19 up sharply during pandemic

Incidence of Diabetes Among Youth Before and During the COVID-19 Pandemic; JAMA Network Open, Sept. 21, 2023.

Diagnoses of Type 2 diabetes among youth under 19, especially Black and Hispanic youth, rose dramatically during the early stages of the COVID-19 pandemic, according to a study published Sept. 21 in JAMA Network Open.

Diagnoses of Type 1 diabetes also rose, but only slightly, according to a study published Sept. 21 in JAMA Network Open.

Researchers led by Matthew T. Mefford, Ph.D. at the Kaiser Permanente health system examined demographic trends associated with the rise in Type 1 and Type 2 diabetes among youth during the pandemic.

Investigators used diagnostics in youth from Kaiser Permanente Southern California collected between Jan. 1, 2016 and Dec. 31, 2021. Subjects 19 years old or younger with no previous diabetes diagnosis were followed through Kaiser's electronic record system.

The researchers calculated the annual and quarterly incidence rates for Type 1 and Type 2 diabetes in terms of diagnoses per 100,000 person-years (PYs) for age groups under 10 and 10-19 years, plus sex, race and ethnicity.

During the study period, 1,200 children developed Type 1 diabetes and 1,100 were diagnosed with Type 2 diabetes. Researchers also found 63 instances of "other" diabetes — cases for which a definitive diagnosis code was unavailable.

The incidence of type 1 diabetes rose from 18.5 per 100,000 PYs between 2016 and 2019 to 22.4 from 2020 to 2021, an increase of 21%. Youth aged 10 to 19 years, males, and Hispanics were at additional risk. The incidence of type 2 diabetes increased from 14.8 per 100 000 PYs from 2016 to 2019, to 24.7, an increase of 67%, with increased risk for the 10-19 age group and nonwhite individuals.

Researchers attributed these findings to possible pancreatic damage from the virus, the stress from infection causing a rise in blood glucose levels, or sedentary behavior.

After-school physical activity and grades — is there a connection?

Effect of Extracurricular After-School Physical Activities on Academic Performance of Schoolchildren; JAMA Pediatrics, Sept. 18, 2023.

Does after-school physical activity negatively affect grades compared with unstructured, child-directed play?

Researchers led by Decai Wong, M.D., Ph.D. at Sun Yat-sen University in Guandong, China, sought to answer this question in a paper appearing in JAMA Pediatrics.

After comparing math test scores for children who had exercised against scores of kids participating in self-directed "free play," they determined that there was no significant difference between the two.

Wong, an ophthalmologist, knows that movement improves physical well-being and delays myopia onset in children. But he also recognized that parents in countries with "competitive educational systems" — like China's — often disapprove of activities that might compromise their child's academic performance.

He enrolled 2,030 children in grades 3 and 4 from 24 elementary schools and assigned them to intervention (physical activity) or control (free play) groups.

The children in the first group engaged in two hours of after-school physical activity outdoors on school days, while children in the control group arranged their own after-school activities.

The main outcomes were differences between the groups on math test scores and results of a myopia examination at one year.

Test scores were deemed noteworthy if they differed by 3.3 points. Myopia was defined as "a cycloplegic spherical equivalent refraction [CPER] of -0.5 diopters or less in either eye." CPER, a measure of the eye's focusing ability, is the critical number in an eyeglass prescription.

Average math scores after one year were 78.01 for the intervention group and 77.70 for the children in the control group. This 0.65 difference was not significant according to the study design.

As expected, fitness scores favored the intervention group by 4.95 points, a difference that was both meaningful and statistically significant. Myopia scores were also significantly improved in children who exercised.

Although exercise tended to produce higher test scores, and these differences may have been statistically significant, that outcome was not part of the study design. The investigators therefore conservatively concluded that exercise was merely "noninferior" to self-directed after-school play.

Will doctors one day 'prescribe' what you eat?

Unraveling the Gut Microbiome-Diet Connection: Exploring the Impact of Digital Precision and Personalized Nutrition on Microbiota Composition and Host Physiology; Nutrients, Sept. 8, 2023.

A preliminary study on the relationship between microbes in the digestive tract (the gut microbiome) and optimal nutrition suggests that one day doctors will prescribe diets to tell them what to eat.

In a paper published Sept. 8 in Nutrients, Giuseppe Maulucci, Ph.D., at the College of the Sacred Heart, Rome, Italy, and colleagues at six other institutions studied the relationship between the gut microbiome and diet.

Their objective was to identify foods that promote a healthy gut microbiome, a significant determinant of human health.

Researchers recruited seven volunteers (four females, three males), ages 25-52, from Maulucci's laboratory staff to self-monitor their weight, diet and "activities" between March-July, 2022. Subjects had not received an antibiotic dose or taken a probiotic supplement in the weeks leading up to the study.

Investigators collected saliva samples to study how the body responds to various nutrients (nutrigenomics), and stool specimens for microbiome analysis. Both tests used genomic sequencing to identify the microorganisms in the samples.

Then, guided by dieticians, they fed these data into Ferrajia Alimentare Dietosystem, a commercial computer program developed by ISI Medica.

Together, dieticians and software assessed microbiome and nutrigenomic data in light of self-reported daily intake of fats, proteins and carbohydrates. Where microbiome compositions deviated from optimal levels, dieticians recommended dietary changes to bring it back to normal.

Because microbiome biomarkers are surrogates for health and not actual outcomes, how these results might affect human health is unknown, which the authors acknowledge in their conclusion:

Although these interesting results pave the way for the integration of nutritional approaches in the modulation of gut health, further research is needed to understand the underlying mechanisms and long-term implications.

Clean clothes, itchy skin?

Is Laundry Detergent a Common Cause of Allergic Contact Dermatitis?; Cutis, April, 2023.

We know laundry detergents clean clothes, but do they also cause dermatitis?

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It turns out, as Adler and his coworkers reported in a paper published in Cutis, that self-reporting by patients overestimated the cause of skin rashes by nearly a factor of five compared with a doctor's evaluation. The researchers attributed this discrepancy to the influence of "popular wellness and beauty websites."

Plus, the authors wrote:

"In our experience, many patients presenting for patch testing have already made the change to "free and clear" detergents without noticeable improvement in their dermatitis, which could possibly relate to the ongoing presence of contact allergens in these "gentle" formulations."

Clinicians use allergy patch tests to determine which irritant is causing an allergy or skin response.

The authors distinguished between contact and allergic dermatitis caused, respectively, by close proximity or touching and a systemic, probably inherited, immune response.

They concluded:

- Many patients and doctors believe laundry detergent causes dermatitis but the evidence is slim
- Although detergents contain many common allergens such as fragrances and preservatives, washes and rinses dilute them to below "clinically relevant levels."
- While the detergent-dermatitis link remains unsettled, the prevalence of this type of allergy is likely far less common than generally suspected.
- However, uncertainty remains for individuals sensitized by the prevalence of skin rash

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Angela DePalma, Ph.D.
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Rob SF
4 days ago
"Although detergents contain many common allergens such as fragrances and preservatives, washes and rinses dilute them to below "clinically relevant levels". This is simply a false statement. Just smell the overpowering scent from fabric washed in a lot of scented detergents, it's enough to make you nat...
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Someone
4 days ago
Also fails to account for the fact that many use fabric softners and dryer sheets. Dryer sheets are far worse than detergent in regards to the ingredients they contain and since they are added in the dryer, it's baking on a coating of terrible ingredients that is disgusted as a nice scent. Most people also use far more detergent than they actually need since the bottles suggest a pretty large amount when your clothes can be clean with a quarter to half of that amount.

Plus people who are using most popular brands of detergent are also likely using the "2 in 1" detergent with softner in it, which is terrible product, and so on. Just washing detergent isn't very effective when it's used with the rest of the crap. Like the combination of the residue from the detergent with the residue of their shampoos, conditioner, soap, etc. that results in problems.
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